REMARKS

Claims 1-37 are pending. Claims 1-37 stand rejected. Claims 1, 10, 16, 20, 29, and 35 are independent claims.

Claims 1, 10, 20, and 29 stand rejected under 35 U.S.C. ' 102(e) as allegedly being anticipated by Hasegawa *et al.* (U.S. 6,718,105) ("Hasegawa").

Claims 1, 10, 20, and 29 recite, *inter alia*, a photonic crystal fiber with a plurality of longitudinal material members with **at least two different refractive indices** disposed in photonic lattice structure, wherein the distribution of refraction of the photonic crystal fiber preform is controlled by the **arrangement of the members**.

In the present invention, the crystal fiber contains photonic lattice structured voids that are filled with at least two members with different refractive indices (Page 6, line 16-18). Such a feature enables the crystal fiber to control the distribution of refractive index by differently arranging the members (Page 7, line 4 – page 8, line 4).

Hasegawa, as read by applicant, teaches an optical fiber with a plurality of voids disposed in photonic lattice structure within a rod-shaped substrate (Column 5, line 26-37). Hasegawa teaches that such voids are filled with one of either gas or liquid, a medium with refractive index that is different from the rod-shaped substrate (Column 3, line 42-46). Moreover, it discloses that such voids are surrounded by a plurality of concentric layers ($n_1 - n_4$), layers which may have refractive indices that differ from one another (Column 5, line 21-30; see also Figure 1 of Hasegawa). Accordingly, the crystal fiber disclosed in Hasegawa contains a plurality of longitudinal material **members with only one refractive index** disposed in photonic lattice structure. Also, the present invention exhibits very low optical loss, very low optical nonlinearity, and excellent transmission

(Page 10, line 9-14). However, nowhere in Hasegawa is there a disclosure that its optical fiber preform exhibits such characteristics. On the contrary, Hasegawa discloses that its crystal fiber simply exhibits a large effective core area (Column 10, line 56-60).

Moreover, as shown in Figure 1 of Hasegawa, the layers (n_1-n_4) are configured in concentric manner, not in photonic lattice structure, as recited in the base claims. Hasegawa teaches, at most, a photonic crystal fiber having **a core with different refractive indices about a radial direction** and a plurality of members with **only a single refractive index disposed in photonic lattice structure**.

Furthermore, applicant submits that Hasegawa's crystal fiber is unable to control the refractive index distribution **by arrangement of the members**, as recited in the base claims 1, 10, 20, and 29. As noted above, Hasegawa's crystal fiber contains members having only one refractive index. As such, altering the arrangement of such members has no effect on the refractive index distribution of the fiber. Hasegawa's crystal fiber, therefore, does not control the refractive index distribution by altering the arrangement of the members, as in the present invention. Instead, Hasegawa's crystal fiber controls the refractive index distribution by **(i) controlling the diameter of voids, (ii) substituting glass substrate with another material, and/or (iii) filling the voids with gas or liquid** (See Column 6, line 10-14 and line 25-36).

Accordingly, applicant respectfully submits that Hasegawa does not anticipate the features cited in the independent claims1, 10, 20, and 29, thus respectfully requests withdrawal of the rejections on claims 1, 10, 20, and 29.

Claims 16 and 35 stand rejected under 35 U.S.C. ' 103(a) as allegedly being obvious over

Hasegawa in view of Jakobsen *et al.* (U.S. Pub 2004/0179796 A1) ("Jakobsen").

Claims 16 and 35 recite similar features as in claim 1. As such, the same arguments relating to claim 1, stated above, equally apply to claims 16 and 35. Further, Jakobsen, as read by applicant, is related to fabricating a microstructured optical fiber that reduces propagation losses, splicing losses, and polarization mode dispersion. Nowhere in Jakobsen is there a teaching of plurality of longitudinal material members with **at least two different refractive indices arranged in photonic lattice structure**, where fiber refractive index distribution may be controlled by **arrangement of the members**. Moreover, present invention, as recited in claims 16 and 35, exhibits very low optical nonlinearity and excellent transmission (Page 10, line 9-14). Moreover, nowhere in Hasegawa or Jakobsen is there a disclosure that it provides very low optical nonlinearity and excellent transmission as in the present invention.

Accordingly, Hasegawa and Jakobsen, either alone or in combination, do not anticipate or render obvious the crystal optical featured in claims 16 and 35.

Other claims in this application are each dependent on the independent claims 1, 10, 16, 20, 29, and 35 and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual consideration of the patentability of each on its own merits is respectfully requested.

Applicants submit that the claims, as they now stand, fully satisfy the requirements of 35 U.S.C. 102 and 103. In view of the foregoing remarks, favorable reconsideration and early passage to issue of the present application are respectfully solicited. Should the Examiner deem that there are any issues which may be best resolved by telephone, please contact Applicant's undersigned representative at the number listed below.

Respectfully submitted,

Steve Cha
Registration No. 44,069

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By: Steve Cha
Attorney for Applicant
Registration No. 44,069

Mail all correspondence to:
Steve Cha, Registration No. 44,069
Cha & Reiter
210 Route 4 East, #103
Paramus, NJ 07652
Tel: 201-226-9245

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Steve Cha, Reg. No. 44,069
(Name of Registered Rep.)

8/2/05
(Signature and Date)